

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 10-16 are active in the application subsequent to entry of this Amendment.

Claims 6 and 7, directed to non-elected subject matter, have been withdrawn without prejudice while the remaining claims 1-5, 8 and 9 have been recast as new claims 10-16. In this process, claims 3 and 8 have been amended to remove the "dot" which was generated by a formatting error and should have been \leq . Similarly, the "dot" appearing adjacent M in original claims 2 and 8, again a formatting error, has been corrected to read Ω . These changes respond to item 2 and the fourth paragraph of item 4 of the Official Action. In preparing this response similar formatting errors in symbols were noted in the specification. To correct this a substitute specification is submitted herewith. No new matter has been added and a marked-up copy of the specification as published is attached.

In addition, the term "type" has been removed from the relevant claims thus responding to item 4, paragraphs 1 and 2. Claim 5, now new claim 14, is adjusted to depend from claim 13 which provides appropriate antecedent basis for an underlayer.

With the above amendments it is respectfully submitted that items 1-4 of the Official Action have been addressed and resolved and leaving only for review the art-based rejection. Reconsideration is requested.

Applicants' claims are directed to a magnetic recording medium composed of a substrate and a Co-containing spinel-type iron oxide thin film formed on the substrate. The thin film has a Co content of 1 to 20 mol% based on Fe, a coercive force value of not less than 159 kA/m (2,000 Oe), a thickness of 5 to 200 nm, a center line average height Ra of 0.1 to 0.8 nm and a maximum height (Rmax) of not more than 10 nm.

Such a magnetic recording medium shows not only a relatively high coercive force, despite a film thickness of no more than 200 nm, and an excellent surface smoothness, and therefore, the magnetic recording medium of this invention is suitable for high-density recording.

The technical objective of the present invention is to provide a magnetic recording medium capable of exhibiting a relatively high coercive force, especially a coercive force of not less than 159 kA/m (2,000 Oe) despite a film thickness of no more than 200 nm, and an excellent surface smoothness.

In the Official Action, claims 1, 3-5 and 9 are rejected as allegedly being "obvious" and therefore unpatentable over the disclosures of the published European application of Tamari et al in view of the U.S. patent to Usuki. Applicants submit that neither of these citations are pertinent to the problem solved by the present invention and therefore neither reference is reasonably pertinent to the problem solved by applicants.¹

EP 0 673 021 discloses a magnetic recording medium comprising: (a) a substrate; (b) an NiO primary layer which is formed on the substrate and in which the plane (200) is substantially oriented in parallel with the surface of the substrate; and (c) a Co-containing maghemite thin film which is formed on the NiO primary layer and in which the plane (400) is substantially oriented in parallel with the surface of the substrate, the molar ratio of Co to Fe is not less than 0.01 to less than 0.10, and the spacing of the plane (400) is not more than 2.082 Å.

The object of EP 0 673 021 is to provide a magnetic recording medium composed of a perpendicular magnetic film which has an excellent oxidation resistance, an excellent corrosion resistance, and an appropriate coercive force (e.g., less than 3000 Oe) for

¹ "Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved." *In re Clay*, 966 F.2d 656, 658-9, 23 U.S.P.Q.2d 1058, 1060 (Fed. Cir. 1992).

"A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering this problem." *In re Clay*, 966 F.2d at 659, 23 U.S.P.Q.2d at 1061.

preventing a magnetic saturation of a magnetic head. This objective is completely different from that of the present invention.

The Examiner states in the Office Action that in one example, the coercive force of a medium with a Co containing spinel iron oxide film having a thickness of 40.8 nm is 2000 Oe. This is not correct.

EP 0 673 021 discloses: "a spinel Fe_3O_4 film having a thickness of 400 Å and a NaCl-type CoO film having a thickness of 8 Å (the molar ratio of Co to Fe was 0.03) were formed on the primary layer at 200°C as one unit of a multilayered film. That is, the thickness of one unit was 408 Å. These operations were alternately repeated 12 times to obtain a laminated film composed of 6 Fe_3O_4 layers and 6 CoO layers." (Emphasis added)

That is, the thickness of the obtained film is:
 $40.8 \text{ nm} \times 6 = 244.8 \text{ nm}$, which is out of the range of applicants' claims.

US Patent No. 6,525,908 (Usuki) discloses a floppy disk, in which a magnetic disk is incorporated in a shell having a liner on inner side thereof, the magnetic disk has a magnetic film formed at least on one side of a flexible support member; the liner contains a rust preventive agent.

The object of Usuki is as follows.

It is an object of the present invention to provide a floppy disk having ... better durability. In particular, the invention provides a floppy disk having sufficient corrosion resistance and durability without impairing the durability of a floppy disk with [a] metal thin film produced by the sputtering method. A magnetic recording medium is provided, which has sufficient corrosion resistance even after the sliding operation by the head on the magnetic surface.

From the above statement it will be apparent that Usuki's objective is different from that of EP 0 673 021 as well as the present invention.

It is true that Usuki discloses that to ensure high electromagnetic transfer characteristics, it is preferable that surface roughness (Ra) of the magnetic film surface is not more than 2 nm, and maximum surface roughness (Rmax) is not more than 60 nm.

However, since neither EP 0 673 021 nor Usuki teach or suggest the object of the present invention, in order to solve the problem solved by the present invention, which is to provide a magnetic recording medium capable of exhibiting a relatively high coercive force, especially a coercive force of not less than 159 kA/m (2,000 Oe) despite a film thickness of no more than 200 nm, and an excellent surface smoothness, one of ordinary skill in the art would not think to combine EP 0 673 021 with Usuki.

The examiner's attempt to combine and/or modify these two references is misguided. The U.S. Court of Appeals for the Federal Circuit has stated that "[t]he mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (citing *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)). Although this statement is couched in terms of modifying the prior art, in May of this year the Board of Appeals and Interferences, in a non-precedential decision (67 USPQ2d 1633 at 1635) held that the mere fact that teachings found in the prior art could be combined as proposed by an examiner does not make the combination obvious "absent some teaching, suggestion or incentive supporting the combination." *Carella*, 804 F.2d at 140, 231 USPQ at 647 (citing *ACS Hosp. Syss., Inc.*, 732 F.2d at 1577, 221 USPQ at 933).

Even assuming one of ordinary skill in the art would be inclined to combine EP 0 673 021 and Usuki, since the thickness of 5 to 200 nm of the Co-containing spinel-type iron oxide thin film is not suggested by such a combination, the present invention as defined by the above claims would not result.

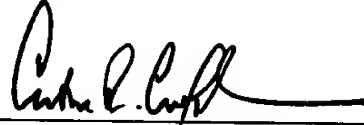
For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and allowance are solicited.

SANTOKI et al
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Respectfully submitted,

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